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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/482,060	01/13/2000	David P. Wiczorek	051252-5029	6503

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EXAMINER

KIM, CHRISTOPHER S

ART UNIT	PAPER NUMBER
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3752

DATE MAILED: 12/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/482,060

Applicant(s)

WIECZOREK ET AL.

Examiner

Christopher S. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 10-19 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) 21-23 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-19 is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 January 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 13 September 2002 is: a) ☐ approved b) ☒ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The Advisory Action mailed on September 20, 2002 is vacated.
2. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn. The finality of the action is withdrawn to consider applicant's traversal of the restriction requirement.
3. Amendment filed September 13, 2002 has been entered.
4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Election/Restrictions

5. Applicant's election with traverse of Invention I (claims 15 and 10-19) in Paper No. 15 is acknowledged. The traversal is on the ground(s) that (1) the Office action fails to provide reasonable examples that recite material differences and (2) non burdensome search. This is not found persuasive because (1) the Office action provides the example "a body passage having an average cross-sectional area less than 2.25 time the substantially uniform corss-section area of the needle" and (2) burdensome search is evidenced by the different classification, any search of additional limitation is considered a serious burden, and applicant's amendment filed May 6, 2002 changed the scope of the method (Invention II) claimed making the restriction proper.

The requirement is still deemed proper and is therefore made FINAL.

6. Claims 21-23 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 15.

Priority

7. Claims 3-5 and 10-19 have not been granted the benefit of the earlier filing date of priority documents since the claimed subject matter is not fully disclosed therein.

Drawings

8. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on September 13, 2002 have been disapproved because they introduce new matter into the drawings. 37 CFR 1.121(a)(6) states that no amendment may introduce new matter into the disclosure of an application. The original disclosure does not support the showing of figures 4A and 4B.

9. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "generally constant cross-section between an outer perimeter and a central aperture" recited in claim 1; the "at least one slot extending tangentially from the at least one fuel passage opening to the central aperture" recited in claim 10 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

10. Claims 1 and 2 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1 recites "a swirl generator approximate the seat and having a generally constant cross-section between an outer perimeter and a central aperture" in line 11-12. The specification discloses, on page 6, lines 23-24, "swirl generator, as shown in Fig. 1, includes a pair of flat disks, a guide disk 86 and a swirl disk 88." The swirl generator (elements 86 and 88) do not appear to have a constant cross-section as evidenced by figures 2A and 2B.

11. Claims 3-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites "the second surface" in line 21. It is uncertain whether it is in reference to the "second surface" recited in line 11 or the "second surface" recited in line 20.

Claim Rejections - 35 USC § 103

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12. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daley et al. (4,971,254).

With respect to claim 1, Daley et al. discloses a fuel injector having a fuel inlet 14; a fuel outlet 12; a body 10; an armature (inherent); a cylindrical needle 16; a seat 20; a swirl generator 18. Daley et al. does not disclose the swirl generator having a guiding member contiguous to a flat disk. Forming the swirl generator of two elements (such as the disc member 22 and retainer member 24 of Daley et al.) is a mere separation of parts. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have formed the swirl generator of Daley et al. from two elements (two flat disk like elements) to ease manufacturing, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179.

The function recitation "when the body is exposed to operating temperatures of a cylinder of an engine" is not a positively cited limitation which only requires the ability to so perform. As applicant has clarified in the response filed on October 5, 2001, applicant is not claiming a cylinder of an engine.

Daly et al. is silent as to being a direct or indirect fuel injector. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have applied the teachings of Daly et al. to a direct injection fuel injector to increase the divergence of the column of fuel.

With respect to claim 2, Daly et al. discloses the limitations of the claimed invention with the exception of the range of the inner and outer diameter of the

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cylindrical annulus. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have made the inner diameter of the cylindrical annulus no more than 50% greater than the diameter of the cylindrical needle and the outer diameter of the cylindrical annulus no less than 100% greater than the inner diameter of the cylindrical annulus, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

13. Claims 3-5 (as best understood) are rejected under 35 U.S.C. 103(a) as being unpatentable over Wieczorek (4,967,959) in view of Muller et al. (6,145,761).

With respect to claims 3-5, Wieczorek discloses a fuel injector (also see Hensley, US Patent 4,610,080 per Wieczorek column 1, lines 61-62) comprising: a body 24 (4,610,080); an armature 26 (4,610,080); a cylindrical needle 12; a seat 14; a first surface 22, a second surface (external bottom of seat member 14), and a cut-out configuration 34. Wieczorek discloses a guide member 26 but does not disclose a swirl generator.

Muller et al. disclose a direct injection fuel injector comprising a swirl generator having a guide member 35 contiguous to a flat disk 47. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have replaced the guide member of Wieczorek with the swirl generator/guide member of Muller et al. to increase the divergence of the column of fuel.

The function recitation "when the body is exposed to operating temperatures of a cylinder of an engine" is not a positively cited limitation which only requires the ability to

so perform. As applicant has clarified in the response filed on October 5, 2001, applicant is not claiming a cylinder of an engine.

Allowable Subject Matter

14. Claims 10-19 are allowed.

Response to Arguments

15. Applicant's arguments filed September 13, 2002 have been fully considered but they are not persuasive.

In response to applicant's argument that Daley indicates a plastic body by sectional legend, Daley does not limit nor particularly distinguish the material of the fuel injector. Although portions of the cross hatching may appear to represent plastic, other section of the same cross-hatching (Fig. 2) indicates metal. Metal fuel injectors are well known in that art as evidenced by Müller et al. (see cross hatching of Müller et al.)

In response to applicant's argument regarding "constant-cross section", see the rejection under 35 U.S.C. 112, first paragraph above.

In response to applicant's argument that one would not be motivated to optimize the injector of Daley as recited in claim 2 because Daley is not concerned with temperature stabilization, optimization in Daley would be a result of proper sizing for fit.

16. Applicant's arguments with respect to claims 3-5 have been considered but are moot in view of the new ground(s) of rejection (35 U.S.C. 112, second paragraph).

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Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher S. Kim whose telephone number is (703) 308-8336. The examiner can normally be reached on Monday - Thursday, 6:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry C. Yuen can be reached on (703) 308-1946. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7766 for regular communications and (703) 308-7766 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.

A handwritten signature in black ink, appearing to read 'Christopher S. Kim', with a long horizontal line extending to the right.

Christopher S. Kim
Examiner
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CK
December 9, 2002